ANGEL FIRE (AF)

DESCRIPTION

Angel Fire (AF) is a wide field of view persistent surveillance (WFVPS) aerial collection asset. AF was primarily developed by engineers at the Air Force Research Laboratory (AFRL) and Los Alamos National Laboratory (LANL). Its capabilities were demonstrated to the Marine Corps throughout 2006 during Mojave Viper exercises in Twenty-nine Palms, CA. Recognizing the utility of a near-real time (NRT) WFVPS sensor, the Marine Corps became AF's service sponsor. AF is a material solution to Marine Forces' articulated lack of dedicated persistent surveillance assets in the Iraqi theater of operations. In late 2006, the Marine Corps, together with AFRL and LANL, obtained both Joint (via the Joint Improvised Explosive Device Defeat Organization) and service funding for an operational assessment of AF.

Angel Fire was designed to provide a dedicated, NRT imagery sensor and distribution system to commanders and units at the tactical level. The WFVPS grid coverage is superior to current Unmanned Aerial Systems (UAS) in that a typical UAS images a relatively small constantly changing area as the air vehicle moves. AF provides a larger, persistent, geo-rectified image with archival capability. While it's wider angle lenses typically result in a loss of detail when compared to a UAS, AF's sensor design and software mitigates this limitation. AF is able to maintain an approximate .5 meter ground sampling distance, a resolution sufficient for identifying dismounted personnel. AF's current configuration consists of the following:

- A manned aerial platform with a belly mounted electro-optic sensor. The long-term goal is to mount the WFVPS sensor package on a UAS.
- The ground receive station, servers, and workstations enable analysts to view data within a ten second latency period at a rate of 1-2 frames per second.
- One or more servers allow analysts to access the imagery in small, user-defined packets thereby minimizing bandwidth requirements. Multiple users may also simultaneously access data independent of each other.
- Stored data is accessible in the same manner as the NRT data; imagery storage is only limited by user requirements and disk space.
- The workstation allows the analyst/viewer to interface with the sensor via controls for zoom, pan, tilt, and the imagery's speed.
- A "TiVo-like" rewind function enables access to archived data in order to facilitate forensic and post-event analysis. This capability provides value added to the tactical commander operating in an irregular warfare environment.

OPERATIONAL IMPACT

As a dedicated WFVPS capability, AF provides tactical commanders with enhanced situational awareness and more precise targeting, thereby increasing operational flexibility, speed, and lethality. AF also enables additional flexibility in managing low density/high demand intelligence, surveillance, and reconnaissance assets.

PROGRAM STATUS

AF began its operational assessment in support of MNF-W in August 2007.

This WFVPS capability was fielded in response to an urgent requirement for a dedicated, near real time, imagery sensor and distribution system with forensic capability for tactical level (i.e., battalion) commanders and units.

Procurement Profile:
This is one (1) suite, consisting of four (4) sensors, deployed in Operation Iraqi Freedom. The purchase and deployment of additional sensors depend upon operational force feedback and the technical readiness of enhanced capabilities.

Developer/Manufacturer:
Air Force Research Laboratory, Los Alamos National Laboratory, CA